IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF MISSOURI

NICOLAS VALADEZ REY and
JESSICA LEANNE QUINN, *et al*.,

Plaintiffs, Civil Action No. 4:19-CV-00714-LMC

v.

GENERAL MOTORS LLC,

Defendants.

DECLARATION OF NICHOLAS J. DURISEK, PH.D., P.E.

STATE OF TEXAS §
§
COUNTY OF HARRIS §

Pursuant to 28 U.S.C. § 1746, I hereby declare under penalty of perjury as follows:

1. My name is Nicholas J. Durisek. I have been retained by the law firm Dykema Gossett PLLC as an expert witness in the above-captioned matter.

2. In compliance with the Court's Scheduling and Trial Order, I submit this Declaration and the attachment hereto, which are incorporated by reference as of set forth fully herein as follows:

   Exhibit A. My Expert Report, prepared in accordance with Federal Rule of Civil Procedure 26(a)(2), which includes – either within it or within the Exhibits, Figures, Appendices, or Attachments thereto – a complete statement of all of my opinions to be expressed and the basis and reasons therefor, the data or other information I considered in forming my opinions, and the exhibits to be used as a summary of or support for my opinions, my qualifications of the witness (including a list of all publications authored by me within the preceding ten years), the compensation to be paid for the study and testimony, and a listing of any other cases in which I have testified as an expert at trial or by deposition within the preceding four years.

I declare under penalty of perjury that the forgoing is true and correct.

Execute on August 31, 2020

Nicholas J. Durisek

Nicholas J. Durisek, Ph.D., P.E.

EXHIBIT B

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REY (NICOLAS) V. GENERAL MOTORS

August 31, 2020

Report Prepared For:

Mr. Michael P. Cooney
Dykema Gossett PLLC
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Bloomfield Hills, MI 48304

Report Prepared By:

Nicholas J. Durisek

Nicholas J. Durisek, Ph.D., P.E.

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1.0 <u>Introduction</u>

1.1 General

I have been asked to determine the circumstances of the single-vehicle crash that occurred on Saturday, August 31, 2019 on Mexican Federal Highway 40 (MX-40), near kilometer 157+090 in Parras De La Fuente, Coahuila, Mexico. As part of my analysis, I have been requested to determine the circumstances of the crash, to reconstruct the crash with the available information, to analyze production documents, and to analyze the motion of the subject 2006 GMC Yukon XL Denali through the crash sequence.

I have reviewed materials related to this crash as listed at the end of this report. Inspections of the crash scene and the crash-involved vehicle have been conducted. I have reviewed the available police information and photographs taken at the scene. I have reviewed vehicle specifications, research conducted by others, and research that I have conducted. I have analyzed the available information and applied accepted engineering principles and techniques to better understand the circumstances of this crash, including the vehicle's motion, trajectory, and speed at different times during the crash.

1.2 Qualifications

I earned a Bachelor of Science in 1992, a Master of Science in 1993, and a Doctor of Philosophy in 1997 in mechanical engineering at The Ohio State University in Columbus, Ohio, USA. In addition to my formal engineering training and including my graduate research, I have over twenty-eight years of automotive engineering experience. My area of specialization in my advanced degrees was large system design, specifically in the areas of vehicle dynamics and vehicle parameter measurement. My master's research and doctorate research focused on how to measure multiple vehicle characteristics simultaneously, accurately, and efficiently. My master's thesis was entitled *The Conceptual Design of a Vehicle Inertia Measurement Facility (VIMF)*. The VIMF is a machine used to measure fundamental characteristics of a vehicle, namely the longitudinal, lateral, and vertical vehicle center of gravity location, the mass moments of inertia about the vehicle's roll, pitch, and yaw axes, and the roll/yaw cross product of inertia. While working toward my doctorate, I organized and lectured an engineering course entitled *System Dynamics*. During the course of my research, I published a master's thesis, a dissertation, and peer-reviewed journal articles describing my research.

In 1997, after I earned my doctorate, I was hired by Ford Motor Company, headquartered in Dearborn, Michigan, as an engineer in Product Development. I performed design analyses, computer simulations, and testing for Ford, Lincoln, Mercury, and Jaguar vehicles primarily related to vehicle dynamics, ride control, and limit handling. I personally instrumented and tested vehicles at Ford's proving ground facilities in Arizona and Michigan and at MIRA in the United Kingdom, a test facility used by Jaguar Cars. I worked on the design and testing of braking system components, including components needed to satisfy the additional requirements and performance criterion of electronic stability control systems. I was part of the first projects at Ford Motor Company wherein an ESC system was being integrated into a passenger car and a light truck. I moved to the United Kingdom to transfer new technology developed by Ford Research to Jaguar Cars. As part of my responsibilities at Ford, I led the Safety Program Attribute Team (PAT) for what became the 2003 Lincoln Navigator. My responsibilities in this role included coordinating crash tests and sled tests and ensuring that the

Navigator's occupant restraint systems, including its airbags and seat belts, satisfied Ford's internal design criteria as well as government performance requirements.

Since 2001, I have been employed as an automotive engineering consultant, specializing in the analysis of crash reconstruction, failure analysis, vehicle dynamics, vehicle electronic stability control, advanced driver assistance systems, vehicle design, and vehicle crashworthiness and airbag deployment. As part of my work, I have conducted numerous crash tests including vehicle-to-barrier, vehicle-to-vehicle, and sled tests to evaluate, in part, overall vehicle motion, response, and crashworthiness. I have installed test equipment on vehicles and conducted on-track testing of various vehicle types, including passenger cars, pickup trucks, utility vehicles, vans, and medium trucks. I have performed numerous tests to evaluate vehicle performance before, during, and after the disablement of various steering components, suspension components, and tires. I have published peer-reviewed articles related to testing and research that I conducted.

In 2007, I formed Dynamic Analysis Group LLC located near Houston, Texas, USA. At Dynamic Analysis Group LLC, I continue to consult as an automotive engineer. I am a registered professional engineer in the State of Alabama, the State of Ohio, the State of South Carolina, and the State of Texas. I am an active member of the Society of Automotive Engineers (SAE) Vehicle Dynamics Standards Committee. Exhibit 01 contains my curriculum vitae that summarizes my background, training, and engineering experience that I use to draw conclusions and opinions. Exhibit 01 also includes my publication list and testimony list. All of the opinions in this report are expressed to a reasonable degree of engineering certainty and are based on my education, training, and experience that are outlined in my curriculum vitae. Dynamic Analysis Group LLC charges $385 per hour for my services. I reserve the right to supplement or modify my opinions if new information is received, and to supplement my opinions in response to the work and opinions of other experts.

2.0 Crash Background

2.1 General

According to police information and other information provided, this crash occurred at approximately 10:30 a.m. on Saturday, August 31, 2019 on Mexican Federal Highway 40 (MX-40), from Saltillo towards Torreon near kilometer 157+090 in Parras De La Fuente, Coahuila, Mexico. Mr. Nicolas Rey was driving a black 2006 GMC Yukon XL Denali westbound in the left lane of MX-40.[1] According to police, Mr. Rey "was showing signs of tiredness, which caused him to lose control of the vehicle."[2] Mr. Rey drove his vehicle off the left side of the roadway, into the median of MX-40, and overturned his vehicle in the median soil. The police noted that "no brake marks before [Mr. Rey exited] the road"[3] were present. The vehicle came to rest on its driver's side facing southeast. According to the right-front occupant, the vehicle was lifted upright onto its tires by people at the scene.[4] Six other passengers were in the vehicle

[1] Mexico Technical Expert Report of Traffic Event (Translated), Technical Report, August 31, 2019, p. 3.
[2] Mexico Technical Expert Report of Traffic Event (Translated), Description of Facts, August 31, 2019, p. 5.
[3] Mexico Technical Expert Report of Traffic Event (Translated), Technical Report, August 31, 2019, p. 3.
[4] Deposition of Jessica Quinn, July 22, 2020, p. 82-84.

at the time of the crash. A satellite image of the roadway with the vehicle's pre-impact travel direction and rest position is shown in Figure 1. Investigating officers created two unscaled diagrams of the crash; a sketch is shown in Figure 2 and a sketch with measurements is shown in Figure 3. The police drawing in Figure 3 indicated that Mr. Rey drove off the left side of the roadway approximately 248.5 meters, or 815 feet, prior to where the vehicle came to rest.

Figure 1. Aerial image of roadway, indicated with original travel direction and rest position.

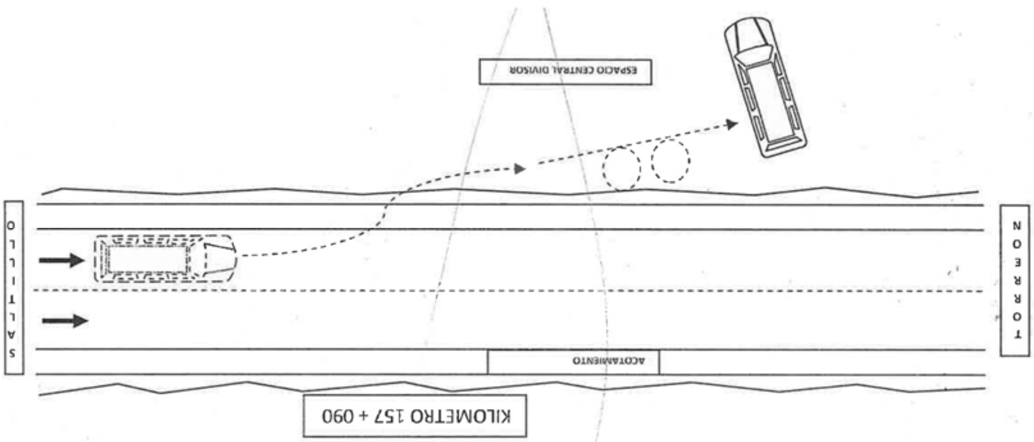

Figure 2. Police sketch (not to scale, rotated).[5]

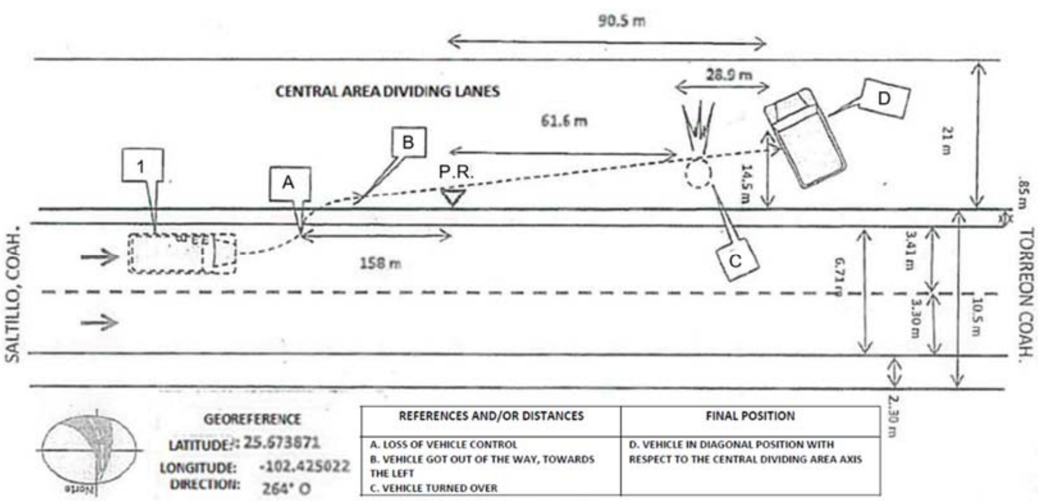

Figure 3. Police drawing (not to scale) with measurements (caption inserted).[6]

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[5] Mexico Police Investigation Materials.

[6] Mexico Technical Expert Report of Traffic Event, Description of Facts, August 31, 2019.

2.2 Driver and Passengers

Mr. Nicolas Rey was the driver of the GMC Yukon XL Denali; at the time of the crash, he was 32 years old and was reportedly belted. Mr. Rey testified that at the time of the crash, he was driving 60 miles per hour.[7] He testified that "the only thing [he] remember[s] is the...truck went to the...left...the driver's side."[8] Mrs. Jessica Quinn, age 29, was the right-front passenger; she was reportedly belted. She testified that they had departed from Torreón, Mexico around 10:00 a.m. the day before the crash. They drove overnight, to the United States Border, and then drove back towards Torreón. Leading up to the time of the crash, Mr. Rey began driving around 6:00 a.m.[9] Ms. Jesslynn Quinn was the middle-row left-seat passenger; at the time of the crash she was 8 years old and her belt status was not noted by the investigating officers. Mrs. Elvira Rey, age 51, was the middle-row right-seat passenger; her belt status was not noted. Master Elijah Quinn was the third-row left-seat passenger; at the time of the crash he was 12 years old and his belt status was not noted. Master Isaiah Quinn, age 9, was the third-row center-seat passenger; his belt status was not noted. Master Juan Vasquez was the third-row right-seat passenger; his age and seat belt status was not noted.

2.3 Crash Scene

The crash scene was inspected under the direction of Dynamic Analysis Group LLC on August 8, 2020 and its condition was documented with notes, photographs, electronic measurements, and video. The crash occurred in Coahuila, Mexico on MX-40 between Saltillo and Torreon. The approximate GPS coordinates of the crash area are 25.6738892° north and 102.425068° west. At the time of the crash, it was daylight, clear, and the road surface was dry asphalt. The speed limit on MX-40 was 100 kilometers per hour (62 miles per hour). Highway 40 was generally oriented as a west-east roadway and had two westbound travel lanes and two eastbound travel lanes that were separated by a depressed loose soil and grass median. A raised berm composed of loose rocks and dirt was present at the center of the median, shown in Figure 4. The travel lanes were composed of traveled asphalt with exposed aggregate and were constructed with a crown. They were relatively straight and flat in the area of the crash. The outer shoulders were partial width, from the save paving as the travel lanes and separated from the travel lanes by a dashed white line. The inner shoulders were from the same paving as the travel lanes, were very narrow, and separated from the travel lanes by a solid yellow line and intermittent yellow reflectors. Travel lanes in the same direction were separated by a dashed white line. The roadsides were composed of loose soil and native grass and sloped downhill to a barbed-wire fence with concrete posts. No permanent visual obstructions were observed for westbound drivers. Dynamic Analysis Group LLC identified unique characteristics of the scene that were documented in a photograph taken nearer the time of the crash. Crash-related evidence was identified including dark tempered glass, clear tempered glass, automotive side mirrors, pieces of amber and clear lens, and pieces of interior and exterior automotive trim. Thicknesses of tempered glass samples were measured. The characteristics of the scene were electronically documented using a Sokkia CX-105 Total Station Survey Instrument. I analyzed these measurements and created a scaled diagram of the crash scene as shown in Figure 5. An elevated view over the center median in the area of roadway departure shown in Figure 6.

[7] Deposition of Nicholas Valadez Rey, July 24, 2020, p. 13.
[8] Deposition of Nicholas Valadez Rey, July 24, 2020, p. 12.
[9] Deposition of Jessica Quinn, July 22, 2020, p. 48-51.

a) Camera oriented easterly. b) Camera oriented westerly.

Figure 4. Berm in center median.

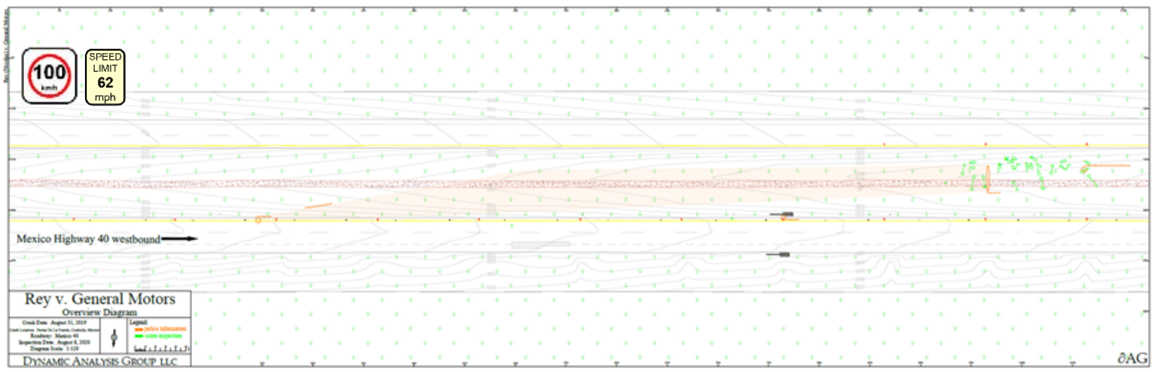

Figure 5. Overview diagram of the scene with evidence indicated.

Figure 6. Elevated view of MX-40 in the area of roadway departure.

Google Street View photographs were taken at the scene in September 2019, within the month after the crash. In the area of the police measured roadway exit, tire marks were visible entering the center median at a gradual angle, shown in Figure 7. The travel lanes in the area of roadway exit were absent of tire marks, Figure 8, consistent with the police documentation. The raised berm in the center median and far side (eastbound) uphill median slope had contact interruptions consistent with the median tire mark trajectory, shown in Figure 9. The measurements recorded by the police were found to be relatively consistent with measurements taken during my scene inspection. I did not identify any environmental conditions at the scene that would have caused the loss of control or that would have prevented Mr. Rey from slowing his vehicle and driving onto the shoulder to stop.

Figure 7. Tire marks gradually departed roadway at police measured roadway departure, Google Street View, September 2019.

Figure 8. No tire marks on the roadway on westbound MX-40 near the police documented area of roadway exit, Google Street View, September 2019.

Figure 9. Disturbances in center berm and uphill median slope, Google Street View, September 2019.

2.4 Vehicles Involved in the Crash

2.4.1 2006 GMC Yukon XL Denali

The subject vehicle was inspected on June 19, 2020 and July 14, 2020; its condition was documented with notes, photographs, and electronic measurements. Figure 10 is a graphic representation of the GMC Yukon XL electronic measurements. The vehicle was a black 2006 GMC Yukon XL Denali four-wheel-drive having VIN 1GKFK66U06J133348. It was equipped with a 6.0 liter V-8 engine, automatic transmission, front-impact airbags, and a four-channel antilock brake system (ABS). The tires mounted on the vehicle at the time of the crash were Bridgestone Dueler H/L Alenza P275/55R20 tires, they were manufactured during the fifth week of 2016, and each had adequate tread depth. All four tires were deflated. The wheels were original equipment and were constructed of aluminum. The left side wheels were fractured at the wheel flange in multiple locations, abraded on the wheel flange and wheel face, and bent in multiple locations. Dirt was adhered to the left-front wheel. The left-front tire inner sidewall was torn or cut. The left-rear tire was punctured and cut on the outer sidewall in multiple locations, shown in Figure 11. I inspected the tires and wheel openings, including the left-rear location, for evidence of a tire disablement and found none. The condition of the tires and wheels were consistent with rollover crash damage.

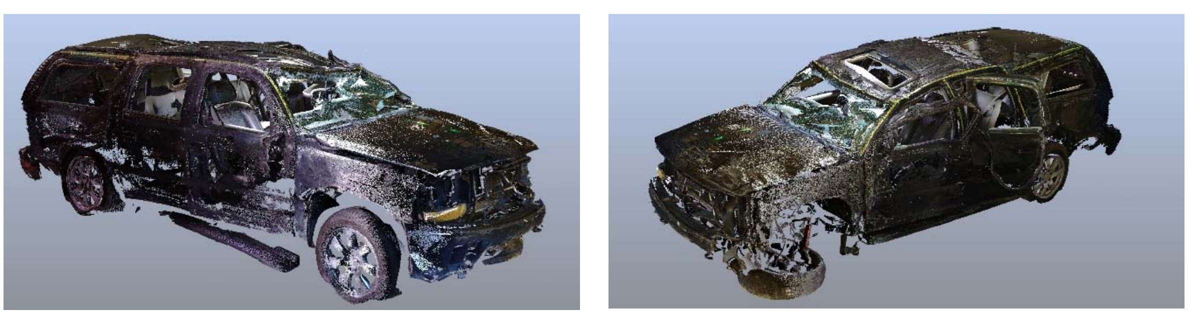

Figure 10. Graphic representation of the subject vehicle measurements.

Figure 11. Left-rear wheel fractured, abraded, and bent; left-rear tire punctured or cut in multiple locations (indicated).

Damage to the vehicle was consistent with a multiple overturn crash and the sheet metal and other components exhibited multiple abrasion patterns from an unpaved surface. The direction of these patterns and other damage to the vehicle were consistent with a passenger's side leading overturn. All glass surfaces with the exception of the rear glass and sunroof were fractured. I measured the glass thickness for the fractured windows where tempered glass fragments were available. Between the first and second inspections, the left-front wheel, tire, brake assembly and related components were separated from the vehicle. The left-front upper control arm ball joint at the knuckle was pulled out. The left-front lower surface of the forward cross member was abraded in a rearward direction and the lower control arm was fractured at the knuckle ball joint. The left-front jounce bumper mount was deformed, the half-shaft was separate from the vehicle, and the shock absorber shaft was fractured at its mount. The left-front stabilizer bar link was deformed and the steering system tie rod was bent and fractured. The right-front suspension jounce bumper exhibited evidence of contact. The left-rear wheel opening indicated tire contact damage, the upper suspension link exhibited evidence of tire contact, and the coil spring shifted in its mount. The track bar was buckled, it was mounted to the axle on the left and to the frame on the right, indicating significant left-to-right loading on the left side. The right-rear wheel opening exhibited tire contact marks and the right-rear coil spring was separate from the vehicle. As part of my inspection, I inspected the functionality of the steering system, brake system, and throttle and did not find any pre-existing conditions that affected functionality.

I have reviewed the Crash Data Retrieval (CDR) report that was created with crash data obtained from the 2006 Yukon Denali XL. A single non-deployment record was recorded. The reported number of ignition cycles on the vehicle from the time of the non-deployment record is

consistent with the crash data being from this crash. The pre-crash data included five seconds of vehicle speed, engine speed, percent throttle application and eight seconds of brake switch circuit state in one second intervals. The record indicated that the driver and passenger seat belts were buckled at the time of the recording. The pre-crash data, shown in Figure 12, indicated that the vehicle speed five seconds prior to the start of algorithm enable was 92 miles per hour, and at one second prior to algorithm enable, it was slowed to 82 miles per hour. The data indicated that Mr. Rey did not depress the brake pedal at any time leading up to algorithm enable. The throttle appeared to be steadily applied three to five seconds prior to algorithm enable, but was increased for at least two instants between zero and four seconds prior to algorithm enable. The engine speed increased with the instants in throttle application, but the vehicle speed decreased, indicating an increase in overall drag. The increase in overall drag on the vehicle is consistent with off-road driving. At algorithm enable, the throttle pedal was not being depressed. The system recorded a maximum longitudinal velocity change of 1.96 miles per hour rearward at 152.5 milliseconds from the start of algorithm enable.

Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle
-5	92	2560	31
-4	91	2560	31
-3	90	2624	61
-2	88	3712	87
-1	82	3008	0

Seconds Before AE	Brake Switch Circuit State
-8	OFF
-7	OFF
-6	OFF
-5	OFF
-4	OFF
-3	OFF
-2	OFF
-1	OFF

Figure 12. Bosch CDR Pre-Crash Data.

3.0 Crash Reconstruction

Using the physical evidence gathered from the vehicle and scene inspections, vehicle and scene photographs, police information, accepted engineering principals and techniques, and all information I have reviewed for this crash, I have determined the vehicle's most likely motion during the crash. Mr. Nicolas Rey was driving a black 2006 GMC Yukon XL Denali westbound in the left lane of MX-40. According to testimony, he had been a passenger and driver in the vehicle during an overnight journey through Mexico, to the United States Border, and then back towards Torreón. On the portion of the journey leading up to the crash, Mr. Rey began driving at approximately 6:00 a.m. until the time of the crash which was reportedly 10:30 a.m. Mr. Rey was driving in excess of 90 miles per hour (145 kilometers per hour) when he drove out of the westbound travel lane, across the narrow inner shoulder, and into the center median soil and grass at a gradual departure angle; the speed limit was 100 kilometers per hour (62 miles per hour). No physical evidence, including tire marks, indicated that Mr. Rey braked his vehicle or steered back towards his travel lane at the time of roadway exit. No physical evidence at the scene indicated that a tire on the vehicle became disabled. The vehicle was slowed as it interacted with the road edge and terrain as it traveled toward a berm in the center median. The trajectory of the tire marks visible in the Google Street View images taken soon after the crash to the consistent disruptions in the median soil were 260 to 350 feet from the police indicated roadway exit. This distance would have taken 2 to 3 seconds of travel time given Mr. Rey's speed, in-line with the CDR pre-crash data.

The lower structures of the GMC Yukon XL engaged the median berm and far-side median slope. The recorded non-deployment event was likely Mr. Rey's first interaction with the berm and far-side median slope. During this interaction, the left-front lower cross member was likely abraded. After more than 600 feet of travel in the median soil and after an unknown number steering maneuvers, the vehicle was directed toward the median berm; the left side tires ramped up the median berm as the right side tires generated increased lateral forces, increasing roll motion passenger side downward while the vehicle was being yawed counterclockwise. The vehicle was overturned with its passenger's side leading. At four-wheel lift, the vehicle was likely being driven approximately 50 to 62 miles per hour. Disturbances in the soil in the likely area of four-wheel lift are shown in Figure 13. The vehicle likely underwent four and three-quarters revolutions with its passenger side leading over a distance of greater than 210 feet. The likely average roll rate during the overturn was approximately 320 degrees per second. The highest average roll rate between roll positions during the overturn was approximately 550 degrees per second, shown in Figure 14. According to testimony, the vehicle came to rest on its driver's side in the MX-40 median facing southeast. During the overturn, the driver and passenger roof rails interacted with the median berm during two different rolls, shown in Figure 15. Primary impacts to the forward and upper driver-door window frame likely occurred between one-half and three-quarters revolutions, one and one-half and one and three-quarters revolutions, and two and one-half and two and three-quarters revolutions. The driver-door window glass was likely broken between one and one-half and one and three-quarters revolutions, within the rollover area indicated by the police, but upstream of their measurement. The crash sequence from the start of the police documented roadway exit to rest is shown in Figure 16. The crash sequence from four-wheel lift to rest is shown in Figure 17. No physical evidence was present in the westbound travel lanes or shoulder indicating a steering or braking maneuver prior to roadway exit.

Figure 13. Disturbances in median berm near four-wheel lift, Google Street View, September 2019.

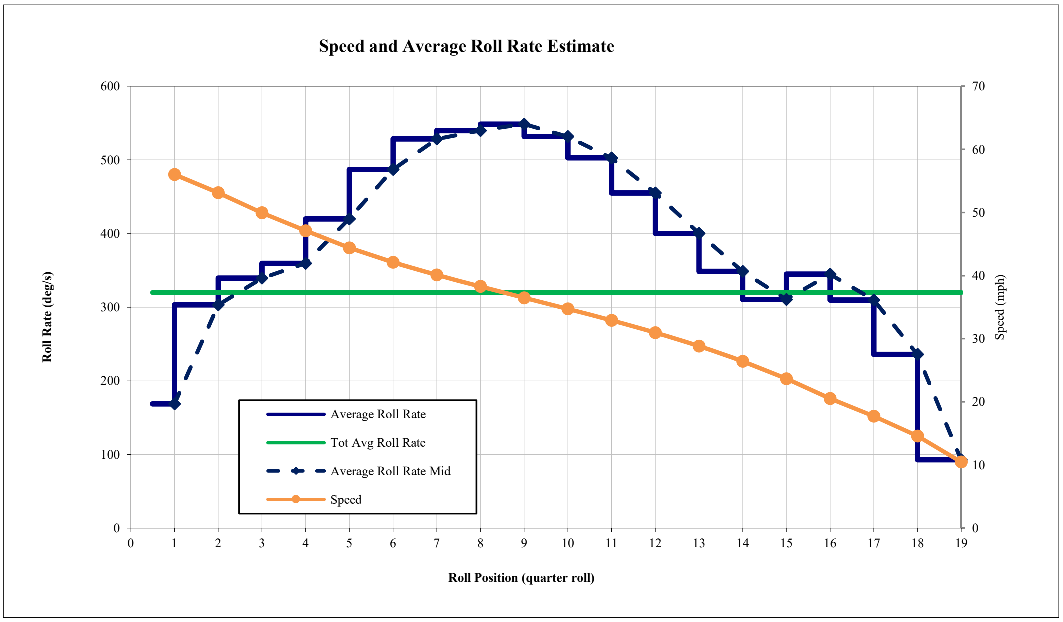

Figure 14. Speed and average roll rate analysis.

Figure 15. Roof contact with berm; abrasions in deformation at different angles.

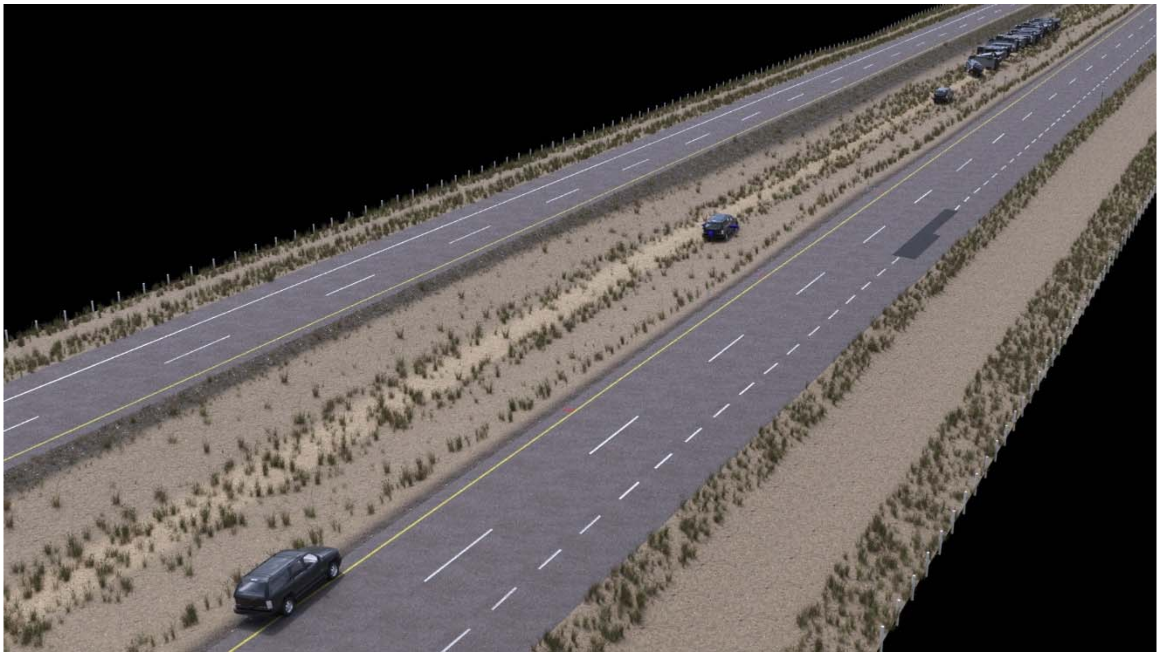

Figure 16. Overview diagram from police measured roadway exit.

Figure 17. Crash sequence leading up to rest, elevated westbound view.

Figure 18. Crash sequence leading up to rest, elevated eastbound view.

3.1 Review of Dr. Ziejewski's Reports

I have reviewed Dr. Ziejewski's reports dated February 5, 2020, April 20, 2020, and August 3, 2020. I disagree with Dr. Ziejewski's conclusion that the cause of the crash was a rear tire puncture. No evidence on the vehicle or at the scene support a rear tire puncture prior to Mr. Rey driving off the roadway and into the center berm. The physical evidence on the vehicle and the characteristics of the scene are consistent with the tire and wheel damage being from impacts during the overturn. Dr. Ziejewski used a police measurement from rest to an area where the vehicle was being overturned for the overall roll distance; this distance is an under estimate for the start of the overturn and is not consistent with the number of scratch patterns present on the vehicle nor the location of the physical evidence at the scene. Fractured driver-door window glass was found at the scene upstream of Dr. Ziejewski's location for the start of the overturn. Dr. Ziejewski's roll distance measurement was within the field of vehicle parts located in the center median, not at four-wheel lift. His underestimate of roll distance resulted in an underestimate of his calculated speed at four-wheel lift and his number of rolls. Dr. Ziejewski correctly indicated the roll direction from the physical evidence on the vehicle in Figures 11 through 13 of his reports, but incorrectly concluded that the directional evidence indicated a driver side leading overturn; Mr. Rey overturned his vehicle passenger side leading. Dr. Ziejewski incorrectly concluded that the CDR record was not related to Mr. Rey's crash. I found the data retrieved to be consistent with Mr. Rey's crash.

4.0 <u>Closing</u>

In performing my analysis, I have determined that Mr. Rey's vehicle was overturned with its passenger side leading in the center median after the left-front tire ramped up a centrally located dirt a rock berm. Mr. Rey was inattentive when he drove out of this travel lane at a gradual

angle and into the center median with no apparent driver response. No tire marks were present on the roadway and no evidence supported pre-roadway exit tire disablement. Prior to his roadway exit, Mr. Rey was exceeding the posted speed limit (62 miles per hour) by driving at more than 90 miles per hour according to the CDR data; the CDR data was consistent with the physical evidence and my reconstruction analysis. His high travel speed compared to traveling at the speed limit reduced the amount of time available to Mr. Rey for steering and braking inputs after he drove off the road. The higher speed also increased the vehicle response to his steering inputs, and it resulted in more energy to be dissipated through braking. He traveled in the center median for more than 600 feet before he overturned his vehicle, enough distance for an attentive driver to stop safely with moderate braking. The vehicle was likely overturned four and three-quarter revolutions mainly on top of the berm in the center median. The vehicle came to rest on its driver's side in the MX-40 median facing southeast. Mr. Rey caused the crash by being inattentive, driving at a high speed in excess of the speed limit, driving off the left side of the roadway, and not responding until after he was in the center median. Based on the number of quarter turns, Mr. Rey's crash was more severe than 99.8% of all rollover crashes. Although no evidence supports a pre-crash tire disablement, if a tire disablement did occur, the tires had adequate capacities for Mr. Rey to control his vehicle and maintain his travel lane, pull to the side of the road, and apply his brakes to stop.

All of the opinions in this report are expressed to a reasonable degree of engineering certainty and are based on my education, training, and experience that are outlined in my curriculum vitae attached hereto. Also attached is a list of my previous testimony. I reserve the right to supplement or modify my opinions if new information is received or in response to the work and opinions of other experts.

5.0 Materials Received and Reviewed

Legal Documents

1. Plaintiffs' Second Amended Complaint
2. General Motors Consultant Work Form
3. Plaintiff Produced Investigation Materials (Spanish)
4. Plaintiff's Designation of Experts
5. Order Granting in Part Third Motion to Amend Scheduling Order and Setting Trial Date
6. Plaintiff's Amended Designation of Experts
7. GM Document Production Log PDF
8. Production Log Spreadsheet
9. GM Production Documents

Responding Personnel

10. Mexico Crash Report
11. Mexico Crash Report Translated

Photographs and Video

12. Plaintiff Produced Yukon XL Vehicle Inspection Photographs (09/02/19) JPEGs
13. Plaintiff Produced Yukon XL Vehicle Inspection Photographs (09/28/19) JPEGs
14. Plaintiff Produced Yukon XL Vehicle Inspection Photographs (10/02/19) JPEGs
15. Plaintiff Produced Yukon XL Vehicle Inspection Video (09/28/19)
16. H. Lu Yukon XL Vehicle Inspection Photographs (12/10/19) PDF
17. Unknown Crash Photographs (08/31/19)
18. Unknown Scene Inspection Photographs (07/24/20)
19. Croteau Yukon Vehicle Inspection Photographs

Vehicle Information

20. Yukon XL - CDR Report (02/18/20)

Depositions

21. J. Quinn (07/22/20); N. Rey (07/24/20)

Reports

22. M. Ziejewski (02/05/20), (04/20/20); H. Miranda-Grajales (05/25/20); B. Herbst (06/29/20); A. Kam (06/24/20); K. Boudreaux (06/19/20); K. Boudreaux (06/24/20); L. Laux (06/28/20); M. Ziejewski (08/03/20); B. Herbst (08/03/20); S. Syson (08/03/20)

6.0 Additional Information Reviewed

1. Vehicle information on the 2006 GMC Yukon XL from VinLink and Canadian Vehicle Specifications.
2. Scene inspection: August 8, 2020; August 20, 2020.
3. Vehicle inspection: June 19, 2020; July 14, 2020.
4. Aerial photographs.
5. Google Street View images.
6. Reports and studies concerning driver demands, performance, and capabilities
7. Materials from the Society of Automotive Engineers
8. Fricke, Lynn, Traffic Accident Reconstruction, First Edition, 1990.
9. Warner, C. Y., et al., "Friction Applications in Accident Reconstruction," SAE Paper No. 830612.
10. Chen, H. F., et al., "Modeling of Rollover Sequences," SAE Paper No. 931976.
11. Cooperrider, N.K., et al., "Characteristics of Soil-Tripped Rollovers," SAE Paper No. 980022.
12. Orlowski, K.F., et al., "Reconstruction of Rollover Collisions," SAE Paper No. 890857.
13. Cooperrider, N.K., et al., "Testing an Analysis of Vehicle Rollover Behavior," SAE Paper No. 900366.
14. Larsen, R.E., et al., "Vehicle Rollover Testing, Methodologies in Recreating Rollover Collisions," SAE Paper No. 2000-01-1641.
15. Hughes, R.J., et al., "A Dynamic Test Procedure for Evaluation of Tripped Rollover Crashes," SAE Paper No. 2002-01-0693.
16. Luepke, P.E., et al. "Rollover Crash Tests on Dirt: An Examination of Rollover Dynamics," SAE Paper No. 2008-01-0156.
17. Luepke, P.E., et al., "Comparing Dolly Rollover Testing to Steer-Induced Rollover Events for an Enhanced Understanding of Off-Road Rollover Dynamics," SAE Paper No. 2011-01-1112.
18. McKibben, J.S., et al., "Development of Techniques to Prevent Occupant Ejection During Rollover–Volume I–Executive Summary," DOT HS-214-2-367, Oct 31, 1973.
19. Hare, B.M., et al., "Analysis of Rollover Restraint Performance with and without Seat Belt Pretensioner at Vehicle Trip," SAE Paper No. 2002-01-0941.
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In addition to the material listed, during the course of my career, I have reviewed numerous documents, materials, reports, and standards published by but not limited to: The Society of Automotive Engineers (SAE); The American Society of Mechanical Engineers (ASME); International Standards Organization (ISO); The Tire and Rim Association (TRA); texts and journals written by engineers and scientists, scientists and safety experts within the industry; and Notices, research reports, studies and Standards issued by the U.S. Department of Transportation concerning automobile design and research. These materials and documents also serve as part of the bases for my opinions.

7.0 <u>Exhibits</u>

01. Curriculum Vitae, Publication List, and Testimony List of Nicholas J. Durisek, Ph.D., P.E.

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Nicholas J. Durisek, Ph.D., P.E.

Specialized Professional Competence

– Crash reconstruction and failure analysis.

– Vehicle dynamics, vehicle electronic stability control, vehicle dynamics testing and simulation, vehicle parameter measurement, advanced driver assistance systems, and advanced chassis systems.

– Design, testing, and evaluation of vehicle crashworthiness and airbag deployment; computer aided engineering, computer modeling of design, and design verification.

– Risk analysis of mechanical designs including the identification of failure modes and assessment of consequences of failure.

Professional Qualifications

– Doctor of Philosophy, Mechanical Engineering, The Ohio State University, 1997
Dissertation: *Simultaneous Overall Measurement Uncertainty Reduction for Multi-Parameter Macro-Measurement System Design*

– Master of Science, Mechanical Engineering, The Ohio State University, 1993
Thesis: *Conceptual Design of a Vehicle Inertia Measurement Facility (VIMF)*

– Bachelor of Science, Mechanical Engineering, The Ohio State University, 1992

– Dynamic Analysis Group LLC, Principal Engineer – 2007 to present

– Tandy Engineering & Associates, Inc., Engineer – 2003 to 2007

– S.E.A., Inc. (SEA, Ltd.), Senior Project Engineer – 2001 to 2003, Researcher (part-time) – 1993 to 1995

– Ford Motor Company (Jaguar Cars, Ltd.)
Senior Project Engineer / Program Analyst – 1999 to 2001
Product Development Engineer – 1997 to 1999

– The Ohio State University, Department of Mechanical Engineering
Graduate Research Associate/Graduate Teaching Associate – 1993 to 1996

– Battelle Memorial Institute, Chemical Warfare Defense, Researcher– 1990 to 1992

– Professional Engineer: Alabama Registration No. 28024-E, Ohio Registration No. 66693, South Carolina Registration No. 22899, Texas Registration No. 104523

– Memberships: American Society for Engineering Education (ASEE); American Society of Mechanical Engineers (ASME); Society of Automotive Engineers (SAE), Ohio Society of Professional Engineers (OSPE), National Society of Professional Engineers (NSPE)

– Honors and Awards: University Fellowship, DuPont Fellowship, Tau Beta Pi, Pi Tau Sigma, Phi Kappa Phi, Golden Key National Honor Society

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PUBLICATIONS

"Automated Vehicle Disengagement Reaction Time Compared to Human Brake Reaction Time in Both Automobile and Motorcycle Operation," Dinges, J.T., and Durisek, N.J., SAE Paper No. 2019-01-1010.

"Analysis of Front Suspension Ball Joint Separations in Motor Vehicle Crashes," Durisek, N.J., Granat, K.J., Holmes, E.W., SAE Paper No. 2009-01-0101.

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"Industry Implementation of Automotive Electronic Stability Control (ESC) Systems," Durisek, N.J. and Granat, K.J., SAE Paper No. 2008-01-0593; *Journal of Passenger Cars: Electronic and Electrical Systems*, Section 7, Vol. 117, pp. 220-244, April 2009, Reprinted from SAE Vehicle Dynamics and Simulation 2008.

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"Vehicle Response Comparison to Tire Tread Separations Induced by Circumferentially Cut and Distressed Tires," Tandy, D.F., Granat, K.J., Durisek, N.J., Tandy, K.T., Baldwin, J.M., Pascarella, R.J., SAE Paper No. 2007-01-0733.

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"Automotive Restraint Loading Evidence for Moderate Speed Impacts and a Variety of Restraint Conditions," Tanner, C.B., Durisek, N.J., Hoover, T.D., Guenther, D.A., SAE Paper No. 2006-01-0900.

"Vehicle Characterization Through Pole Impact Testing, Part II: Analysis of Center and Offset Center Impacts," Durisek, N.J., Tandy, K.T., Claussen, J.S., Tanner, C.B., Brantman, R., Guenther, D.A., SAE Paper No. 2005-01-1186.

"Delta V, Barrier Equivalent Velocity and Acceleration Pulse of a Vehicle During an Impact," Cheng, P.H., Tanner, C.B., Chen, F.H., Durisek, N.J., Guenther, D.A., SAE Paper No. 2005-01-1187.

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"Pole Impact Speeds Derived from Bilinear Estimations of Maximum Crush for Body-On-Frame Constructed Vehicles," Chen, H.F., Durisek, N.J., Tanner, C.B., Guenther, D.A., SAE Paper No. 2004-01-1615.

"Effects of Loading on Vehicle Handling," Heydinger, G.J., Bixel, R.A., Durisek, N.J., Yu, Enyu, Guenther, D.A., SAE Paper No. 980228; *Journal of Passenger Cars*, Section 6, Vol. 107, pp. 407-415, February 1998, Reprinted

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"Calibration Fixture Design for Vehicle Center of Gravity Height and Inertia Measurements," Durisek, N.J., Heydinger, G.J., Bixel, R.A., VRTC Final Report, DTNH22-94-P-08424, April, 1995.

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"Non-Rigid Body Product of Inertia Measurement: Application to Land Vehicles," Durisek, N.J., Heydinger, G.J., Chrstos, J.P., and Guenther, D.A, DSC-Vol. 54/DE-Vol. 76, Transportation Systems, ASME, pp. 375-386. (Presented at the 1994 International Mechanical Engineering Congress and Exposition, Chicago, Illinois, November 6-11, 1994.)

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Design and Analytic Analysis of a Magnetic Thrust Bearing, Durisek, N. J., Undergraduate Thesis, The Ohio State University, March, 1992.

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DEPOSITION & TRIAL TESTIMONY

Smith (Ramona) v. FCA US LLC, et al. Eastern District of Texas, Texas	1:15-CV-0218	08/25/16
Pertile (Daniel), et al. v. TRW, et al. District of Colorado, Colorado	1:15-cv-00518-NY	09/16/16
Costly (Lakiva) v. Nissan Parish of Ascension, Louisiana	14-244-JWD-SCR	02/23/17 (Trial)
Chan (Francis) v. Budd (James), et al. Harris County, Texas	2015-18367	03/08/17
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Guardiola (Mercedes) v. FCA US LLC Starr County, Texas	DC-14-489	01/24/18 (Hearing)
Chan (Francis) v. Budd (James), et al. Harris County, Texas	2015-18367	05/17/18 (Trial)
Rocha (Maria) v. Wal-Mart Bexar County, Texas	2016-CI-10692	09/06/18
Munoz (Elvia) v. Goodyear Dimmit County, Texas	13-06-12009-DCVAJA	09/18/18
Price (Glenda) v. General Motors LLC Western District of Oklahoma, Oklahoma	5:17-cv-00156-R	09/27/18
Idica (Heather) v. Hyundai Superior Court of Washington In and For Pacific County	17-2-00168-25	12/14/18
Paqpaqui Crash, October 2015 Malta		01/30/19 (Trial)
Munoz (Elvia) v. Goodyear Dimmit County, Texas	13-06-12009-DCVAJA	02/19/19 (Trial)
Scanlon (Lawrence R., III) v. Hyundai Beaufort County, South Carolina	2016-CP-07-622	06/10/19
White (Susan), et al. v. FCA US, LLC U.S. District Court Eastern District of Michigan, Southern Division	17-12320	07/11/19

Jones (Janice) v. Hyundai Orangeburg County, South Carolina	2015-CP-38-00397	10/31/19
Martinez (Irma) v. Continental Tire Santa Fe County, New Mexico	D-101-CV-2017-02187	11/08/19
Gilreath (Daniel) v. FCA US LLC Butler County, Ohio	CV 2018 07 1583	11/20/19
Cline (Kelley) v. FCA US LLC Orangeburg County, South Carolina	2016-CP-38-01586	06/05/20
Holliday (Gary) v. Nissan Charleston County, South Carolina	2:18-CV-01503-RMG	06/30/20